

# Anne-Kathrin Pöhls

## Deutsche Bahn

#LeanLPS

Organiza y promueve

Promueve

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DPA ARQUITECTURA

BIM Community

Con la colaboración de





Foto: Volker Emersleben

# Lean approaches in Deutsche Bahn railway projects – experiences – benefits - challenges

DB Netz AG, I.NGW(P), Anne-Kathrin Pöhls

itec – LPS Conference Barcelona, May 2016

- Introduction of organisation / myself
- Public funding in German railway infrastructure
- Examples of application:
  - Tunnel projects
  - VDE 8 - hump yard project
- Conclusion

- DB Netz AG – within Deutsche Bahn AG Holding the organisation responsible for infrastructure (operation, maintenance, rebuilding, new investments)
- Within DB Netz AG – Project management teams (all over Germany)
- New investments are funded by different budgets of tax money, maintenance is financed by DB

- My current project: VDE 8 – largest infrastructure project in Germany – high speed train line Berlin – Munich, VDE 8
- Cost and Schedule controller for project section in Nürnberg / Bavaria
- Over 10 years of project management experience in several different DB projects
- Mostly cost and schedule control

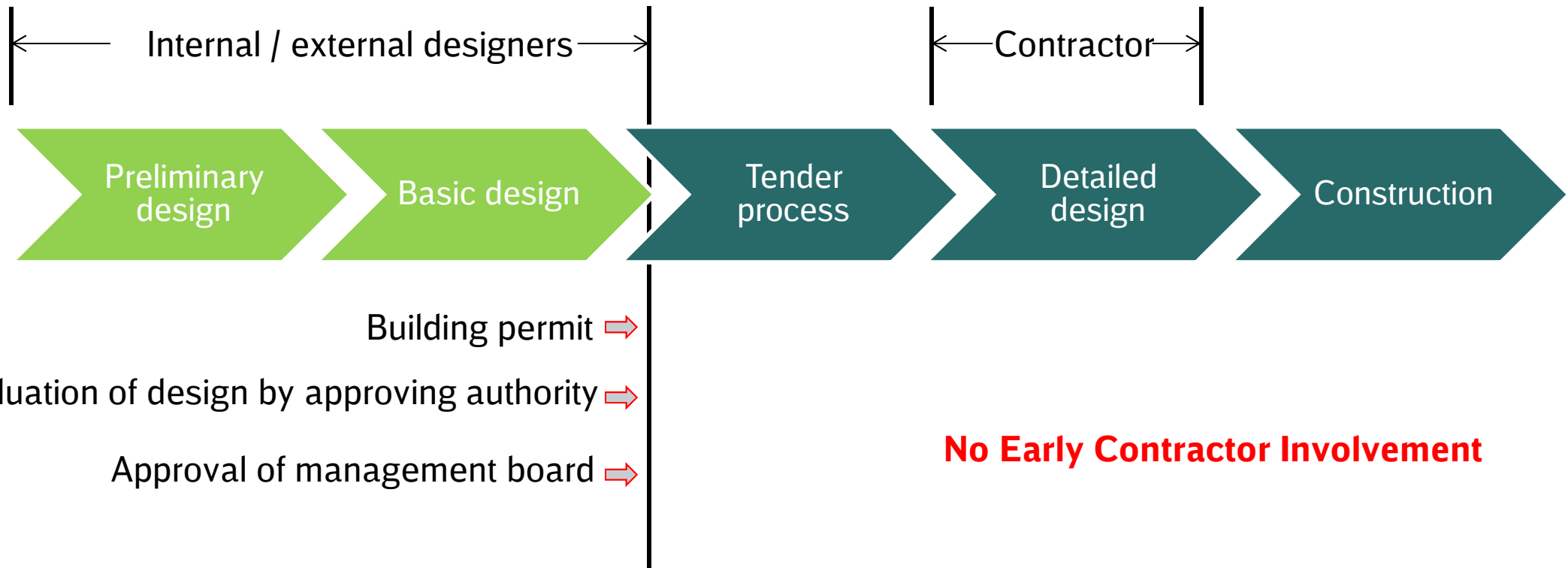
- Why lean (last planner) for me?
- Answer to all my questions / problems as schedule controller
- First pilot project in 2007:

Remodelling of an existing tunnel project including all trades  
in 14 month shut down

# Funding / Design process at DB – new investments !!

## Design Budget

## Execution Budget



**Pilot project:**

# **Remodelling „Nitteler Tunnel“ - existing 120 year railway tunnel - 2007**





# Pilot project: Remodelling of existing 120 year old tunnel

- Approx. 24 Mio. €
- Application of Last Planner started in design phase
- Although detailed design and construction
- Differences to classical project management during design:
  - ➔ Client (operator) participated in Last - Planner - workshops
  - ➔ Site supervising personnel was invited to LPS - workshops to try to implement lessons learned and „pull“ from the site

# Pilot project: Remodelling of existing 120 year old tunnel

- Classical tendering process, only best price bids (bill of quantities) - but
- Differences during construction phase:
  - ➔ Description of the way of collaboration in all 3 construction contracts
  - ➔ Detailed design had to be made all at the same time with regular LPS meetings on site (interface management)
  - ➔ One big room directly on site where the regular meetings took place
  - ➔ Geotechnical consultant - responsible for checking detailed design was present

# Pilot project: Remodelling of existing 120 year old tunnel

- Benefits:

- ⇒ Very positive mood on site – everyone could rely on the other
- ⇒ 14 month shut down period was sufficient for the whole construction work
- ⇒ Many geotechnical problems / obstacles occurred during construction phase – existing old tunnel building in a difficult geotechnical environment – several classical owner risks occurred
- ⇒ **Planned budget was exceeded** due to the many geotechnical risks!!

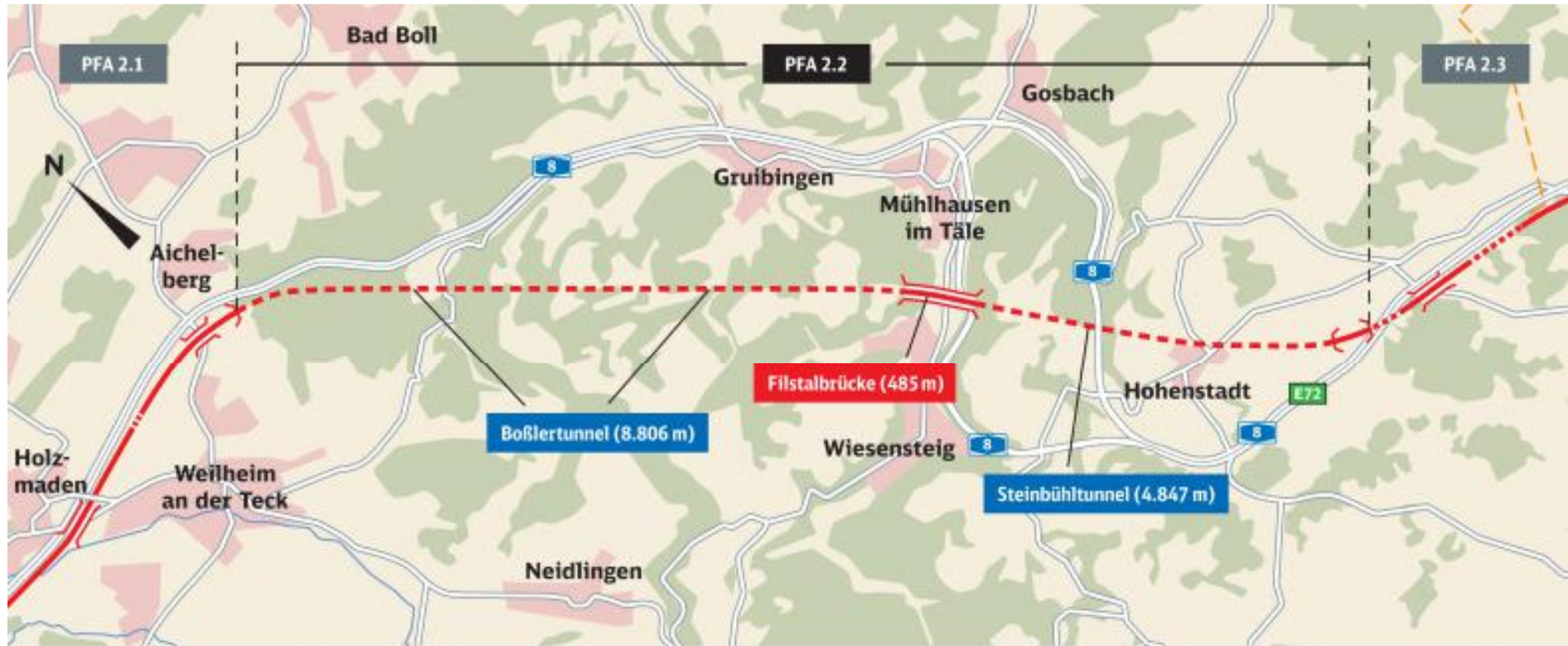
Necessary on the client side to treat change orders fairly



# Bahnprojekt Stuttgart-Ulm

Gemeinsam für das Bahnprojekt Stuttgart - Ulm

# Section of Stuttgart 21: 2.2 „Albaufstieg“



- Neubaustrecke, offene Linienführung
- - - Neubaustrecke, Tunnel
- PFA = Planfeststellungsabschnitt
- EÜ = Eisenbahnbrücke (Eisenbahnüberführung)

Im Planfeststellungsabschnitt 2.2 bewältigt die Neubaustrecke den Aufstieg auf die Schwäbische Alb. Die Autobahn windet sich in zahlreichen Kurven bergauf – die Neubaustrecke löst sich von der Fernstraße und nimmt den direkten Weg durch den Berg.

# Site office Aichelberg „White House“



**DB**

**ARGE Tunnel  
Alaufstieg  
(contractor)**

**Site  
inspection**

# Lean Room Aichelberg – Place of communication



Lean Management  
Training  
12.12.2014

- Results / Experiences:

- ➔ Big room – place where inspectors / clients / contractors can meet
- ➔ Rule: Always talk first before you plan to write a letter
- ➔ Last Planner: Approval engineer for detailed design – participated
- ➔ If all stakeholders are serious about it, LPS / Lean works
- ➔ In current contract situation – if monetary differences get too big, mutual consent is lost

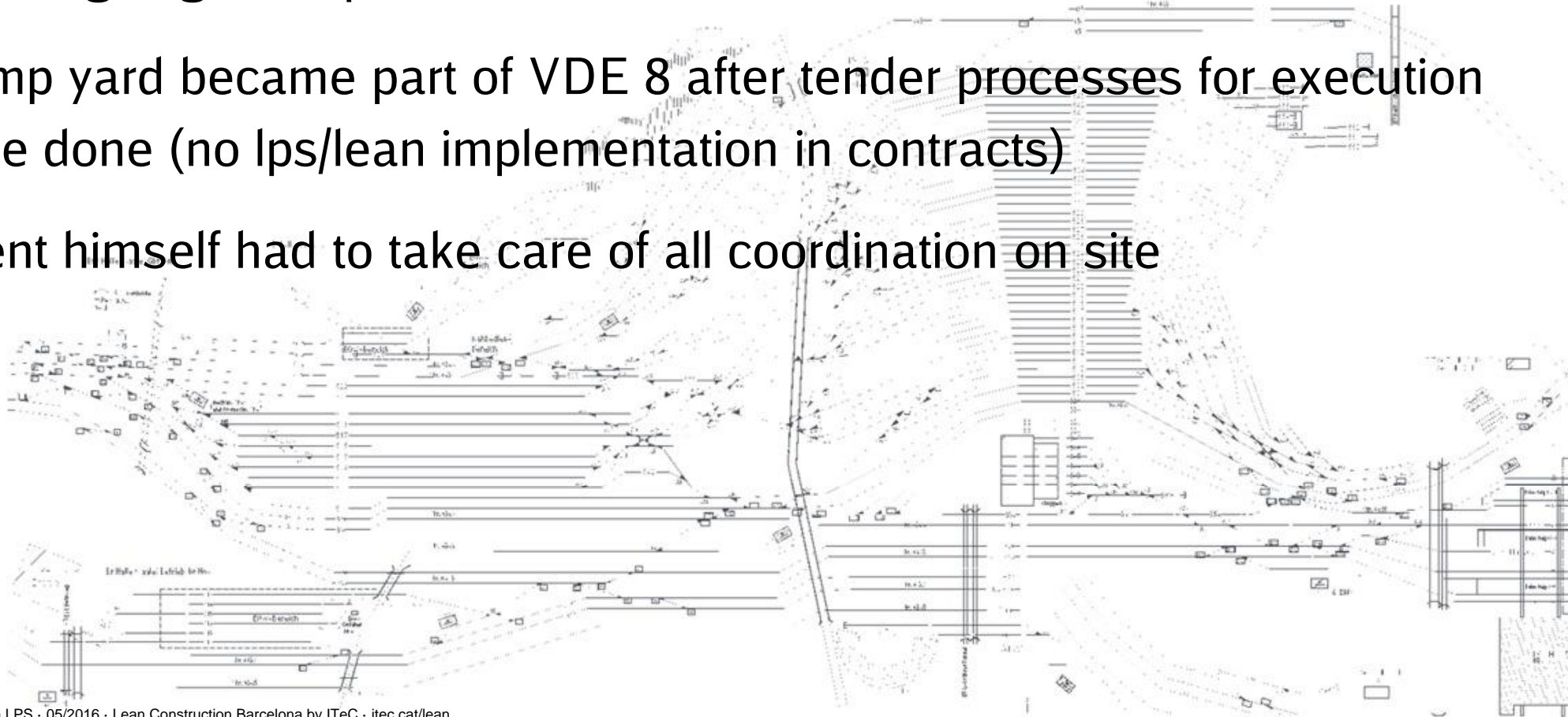




“ZBA Halle” – Using the last planner *to ensure critical time frame while modernizing* the (railway) humb yard in the city of Halle

# Halle hump yard – VDE 8

- Part of VDE 8 – biggest infrastructure project since reunification
- Will be going into operation in 2017
- Hump yard became part of VDE 8 after tender processes for execution were done (no lps/lean implementation in contracts)
- Client himself had to take care of all coordination on site



Leistungsfähigkeit Ablaufberg:  
bis zu 120 Wagen/h

8 Einfahrgleise

2 Ausfahrgleise

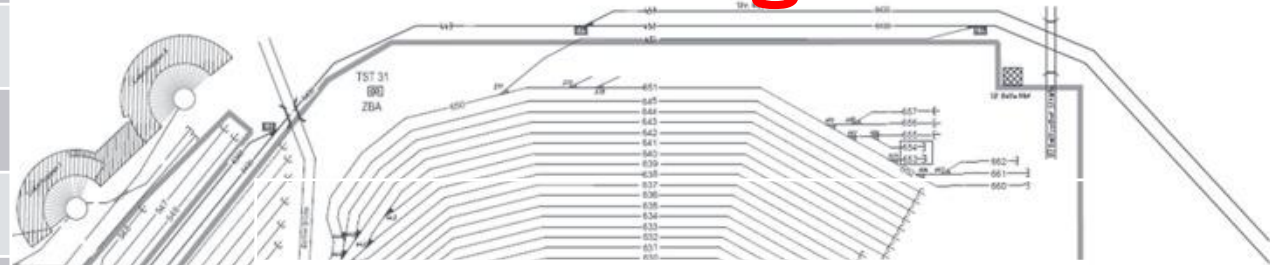
36 Richtungsgleise

4 Talbremsen

36 Richtungsgleisbremsen

12 Förderanlagen

**20 different trades in  
single tenders had to  
be managed**



259.000m<sup>2</sup> Fläche

200.000m<sup>3</sup> Erdbewegung

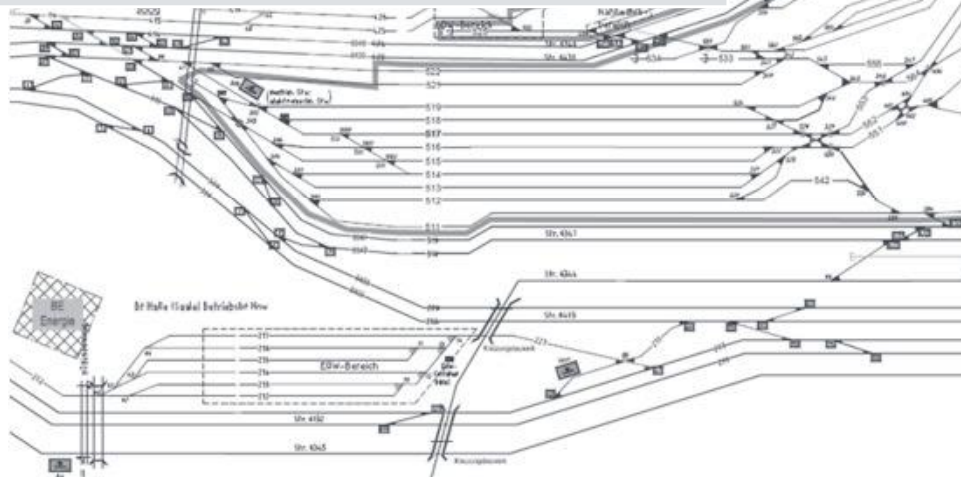
76.000t Schotter

42,5km Gleise

75.500 Schwellen

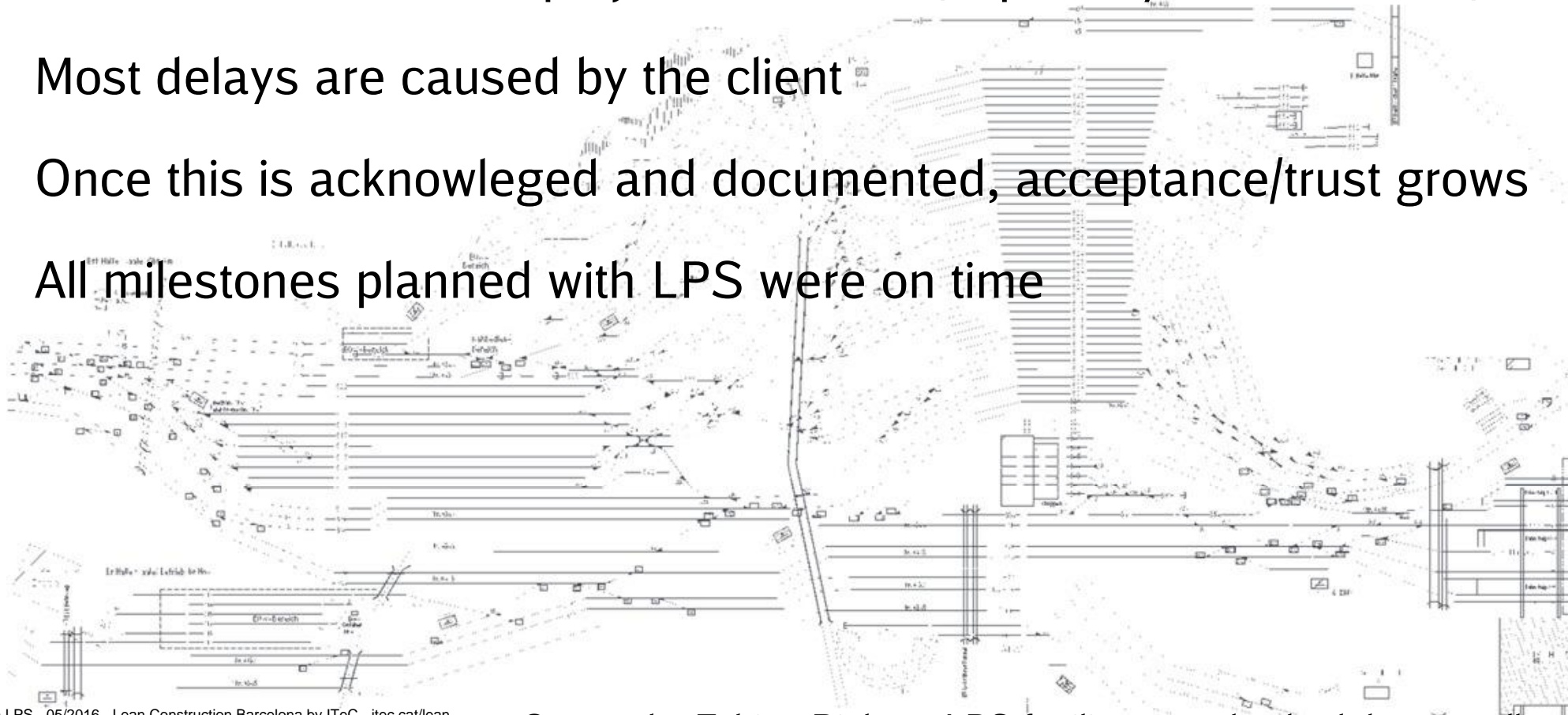
133 Weichen

54.000 Kabeladern



- Results / experiences (so far):

- ➔ Hard work to convince project members (especially on client side)
- ➔ Most delays are caused by the client
- ➔ Once this is acknowledged and documented, acceptance/trust grows
- ➔ All milestones planned with LPS were on time



- Benefits applying LPS and Lean are possible, even in a non perfect lean environment
- Limits with traditional contracts can be big differences in monetary aims
- Applying LPS even if problems occur brings benefits up to this point – NOTHING CAN BE LOST
- Hard to promote within company – projects that work well have no management attention
- Strong minded „Promoters“ are necessary to start – either external consultants or project leaders
- Client has to be self critical !!

# Positive developments for more cooperation in Germany

- Reform Commission for public capital projects
- First collaborative public project: Hospital of US forces (under German jurisdiction and funding)
- Awareness rises that things have to change in building projects (industry, owners)
- Existing public approval authorities biggest challenge

**Thank you**